

RESEARCH HIGHLIGHTS

ANIMAL BIOLOGY

Savvy spiders

J. Exp. Biol. 213, 2372–2378 (2010)

Jumping spiders have exceptional eyesight compared with other creatures of their size, but biologists may have underestimated the visual acuity of one of their pairs of eyes.

The spiders have a principal pair that faces forwards and has excellent resolution but a very narrow field of view, and two or three secondary pairs that detect motion over a wider field. Daniel Zurek and his colleagues at Macquarie University in Sydney, Australia, used dental silicone to cover all but one pair of eyes — the set of secondary ones that faces forwards — in 52 jumping spiders (*Servaea vestita*). They then presented the arachnids with moving dots on a screen, and with live, tethered house flies, the spiders' favoured prey.

The spiders oriented themselves in the direction of the dots and began stalking the flies. This pair of secondary eyes, the authors say, may be the most versatile element of the creatures' visual system, providing both spatial acuity and motion detection. **J.F.**



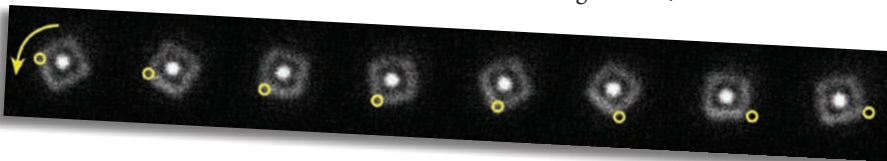
X. J. NELSON

NANOTECHNOLOGY

Photons make light work

Nature Nanotechnol. doi:10.1038/nnano.2010.128 (2010)

Light particles carry momentum but, individually, not enough to move a physical object. Now Xiang Zhang and his colleagues at the University of California, Berkeley, have found a way of putting light to work. The team designed a nanometre-scale gold 'motor' with a physical structure that maximizes the strength of its interaction with light at specific wavelengths.



The light acted like a person pushing a swing, making the motor spin. The torque generated was strong enough to visibly rotate a micrometre-sized square silica disc (pictured) attached to the motor. The researchers say that the motor could eventually be used as the basis for tiny wireless devices. **G.B.**

ATMOSPHERIC CHEMISTRY

Airborne alcohol

Atmos. Chem. Phys. 10, 5361–5370 (2010)

One in three ethanol molecules in the atmosphere originates from industrial sources and biofuels, scientists have calculated.

Ethanol derived from biomass has been widely promoted as a substitute for fossil fuels. But the overall impact of increased

ethanol burning on atmospheric chemistry is largely unknown.

Vaishali Naik, then at Princeton University in New Jersey, and her colleagues used available observations and a global chemical-transport model to constrain the poorly defined global ethanol budget. They estimate that terrestrial plants produce about nine million tonnes per year, whereas five million tonnes come from anthropogenic sources, and a further half a million tonnes from biomass burning. However, the authors warn that the uncertainties are large, particularly for the ethanol concentrations over remote oceanic regions. **Q.S.**

CELL BIOLOGY

Protein clean-up crew

Science doi:10.1126/science.1191542 (2010)

Cystic fibrosis is caused by mutations in a protein called CFTR, which is found in cells' outer membranes. Attempts to express a functional version of the mutant protein have failed, partly because the rescued protein is rapidly degraded. Gergely Lukacs of McGill University in Montreal, Canada and his colleagues have identified the proteins that work together to eliminate this and other defective proteins from the outer membrane.

They found that a protein called Hsc70, helped by other molecular 'chaperones', recognize mutant CFTR at the cell surface that has not been properly folded into

its three-dimensional structure. This biochemical pathway may serve as a back-up quality-control system for proteins that have escaped the cell's other 'housekeeping' methods, the authors say. **H.L.**

NEUROSCIENCE

Smells affect sight

Curr. Biol. doi:10.1016/j.cub.2010.05.059 (2010)

For humans and other primates, sight tends to dominate sense of smell; often what we see affects what we smell. Researchers have found evidence that the opposite may also be true: olfaction can influence visual perception.

Wen Zhou, at the Chinese Academy of Sciences in Beijing, and her colleagues showed volunteers two images, one of a rose and one of marker pens. The volunteers viewed the images through special glasses so that each eye saw a different image at the same time, although the volunteers were aware of only one image at a time. They were also exposed to odors that smelled like either roses or pens.

The volunteers reported seeing the rose for longer periods of time when sensing the rose smell, and a similar bias when smelling the pens. The authors also show that the effect is partly subconscious. **C.L.**

CHEMISTRY

Metal-organic catalyst

Angew. Chem. Int. Edn doi:10.1002/anie.201000863 (2010)

Fuel cells and other applications depend on electro-oxidation reactions. The platinum-based catalysts generally used for these